REMARKS

Claims 1, 2, and 5-22 remain pending in this application. By this amendment, Applicant has amended claims 1, 2, 7, 12-14, 17-19, and 22. The amendments to claims 1, 2, 7, 12-14, 17-19, and 22 are supported in the originally filed application, *e.g.*, in the as-filed specification at page 17, lines 13-26.

Applicant respectfully requests reconsideration and withdrawal of the 35 U.S.C. §103(a) rejection of claims 1, 2, and 5-21 over Sebastian (US Patent No. 5,552,995) in view of Shebini (US Patent No. 4,858,146), and "Repairing CAD Models" by Gill Barequet et al. ("Barequet"). The Office Action apparently asserts that Sebastian teaches all of the features of claims 1-2, and 5-21, except 1) a database accumulating technical conditions; and 2) the errors determined using a corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface. The Office Action, however, relies on Shebini as allegedly disclosing the database accumulating technical conditions and relies on Barequet as allegedly teaching to determine errors using a corresponding surface group. The Office Action further asserts that it would have been obvious to combine the disclosures of Sebastian, Shebini, and Barequet.

As explained below, the cited references, taken alone or in combination, do not disclose, teach or suggest all of the elements recited in the independent claims, including, for example, the feature "wherein the errors determined using the corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a

direction of a surface, and folding of a surface," as recited in each of claims 1, 2, 7, 9, 11-15, and 17-20, and the feature wherein a "shape model, comprising a second reference surface. . . is formed by sequentially reproducing the selected unit work history," as recited in amended claim 1 and similarly in previously presented independent claims 9, 11, 15 and 20 and currently amended independent claims 2, 7, 12-14, and 17-19.

The Office Action, at page 12, acknowledges that Sebastian and Shebini do not explicitly teach errors determined using a corresponding surface group including at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface, but apparently alleges that Barequet discloses these claimed features. Applicant respectfully disagrees.

Barequet discloses "an algorithm for repairing polyhedral CAD models that have errors in their B-REP [Boundary Representation]. Errors like cracks, degeneracies, duplication, holes and overlaps. . ." Barequet, Abstract, pg 363. Barequet further refers to "algorithms to eliminate dangling geometry, T-Joints, holes and cracks in a polygonal solid model and generate consistent polygon-orientations." Barequet, Introduction, pg. 363. Barequet describes an automated algorithm that operates by shifting the vertices of the polygons within a single shape model. *Id.* 364. The technique of Barequet "takes as input a soup of polygons and outputs the adjacency structure of the corrected model." *Id.* A "soup of polygons" is described by Barequet at page 363 as a technique of representing a CAD model. Barequet, therefore, teaches a technique which receives a single CAD model represented by a soup of polygons as input, performs the

automated task of vertex shifting to correct certain errors, and outputs the structure of the single corrected model.

In contrast, independent claims 1, 2, 7, 9, 11-15, and 17-20 recite the use of a user-generated corresponding surface group to determine errors including "at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface," in a combined shape model. Barequet fails to disclose, teach, or suggest the use of a user-generated corresponding surface group in order to determine any such error. Barequet merely discloses an automated technique of comparing and shifting vertices to correct errors.

Barequet also fails to disclose, teach, or suggest the use of a combined shape model created from multiple work history data, wherein the combined shape model is formed by joining part shape models. Barequet merely discloses a technique of correcting errors within a single CAD model representation, and not one or more errors in a combined shape model, as recited by the independent claims. Thus, Barequet teaches a different technique in a different type of model as compared to the independent claims.

The Office Action alleges that "[t]he combination [of alleged teachings of Sebastian and Barequet] could be achieved by using Barequet's algorithms in the system and method described by Sebastian to identify and correct the same types of errors in Sebastian's CAD models." Office Action, pg. 7. However, even if the error identifying algorithms of Barequet could be used in Sebastian's CAD model (a notion that Applicant disputes) the hypothetical combination of Barequet and Sebastian would not have the recited claim feature "wherein the errors determined using the

corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface," as recited in claims 1, 2, 7, 9, 11-15, and 17-20. Indeed, as compared to these independent claims, Barequet discloses an entirely different error identifying algorithm applied to a different model. Barequet discloses the use of an automated vertex shifting algorithm to correct errors in a single CAD model, which is entirely different from using a corresponding surface group to determine errors in a combined shape model, as recited in claims 1, 2, 7, 9, 11-15, and 17-20.

The Office Action apparently asserts, at page 9, that Sebastian discloses the use of a corresponding surface group to determine errors in a combined shape model. While not explicitly stated, it appears that the Office Action may be relying on Sebastian as purportedly disclosing the claimed error identifying technique and Barequet as purportedly disclosing the claimed errors to be identified. This combination, however, is inappropriate because the independent claims recite a technique to determine one or more of certain types of errors in a particular type of shape model, a combined shape model. Any errors detected in a different type of shape model, *e.g.*, a single CAD model, must be different errors. Even, hypothetically, if the technique of Sebastian were to be interpreted to correspond to the technique recited by the claims (a notion that Applicant disputes) and the errors determined by the technique of Barequet were to be interpreted to correspond to the determined errors recited by the claims (another notion that Applicant disputes), mixing and matching techniques and results in this fashion would not have been obvious to one of ordinary skill in the art. A person of ordinary skill

in the art would not have had any legitimate reason to assume that a technique described in one reference might produce the same results as an entirely different technique described in a different reference. Even if the asserted error determination techniques of Sebastian were to produce the same results as the wholly different technique of Barequet, there would not have been any legitimate reason to believe that Sebastian's techniques might achieve Barequet's results.

Shebini discloses the use of a database for the storage of finite element model components, and is silent on techniques for determining errors in shape models. Shebini, therefore, fails to disclose the claim features, described above, missing from Sebastian and Barequet.

Regarding the claim feature wherein a "shape model, comprising a second reference surface. . . is formed by sequentially reproducing the selected unit work history," a recited in amended claim 1, and similarly in previously presented claims 9, 11, 15 and 20 and currently amended claims 2, 7, 12-14, and 17-19, the Office Action, at page 26, asserts that Sebastian, at col. 11, lines 32-49 and col. 12, lines 3-11 teaches this feature. Sebastian, however, discloses a "template scheme [that] provides a uniform data handling mechanism that spans the domain of part, tooling, process and material," col. 11, lines 32-34. Each "feature template is a representation of a primitive object which has a form and a function," col. 12, lines 3-4, that "can be combined to create macro-feature templates," col 11, lines 56-57. Thus, Sebastian merely discloses a data handling mechanism that utilizes primitive feature templates that may be combined to form more complex parts.

In contrast, amended claim 1, for instance, recites "creating a combined shape model, comprising a second reference surface, which is formed by sequentially reproducing the selected unit work history." This involves creating a shape by sequentially stepping through individual design procedures used to create the unit work history, e.g., as detailed in the instant specification at page 17, lines 13-26. This feature of amended claim 1 permits sequentially stepping through each single design procedure, such as designating a primitive or inputting coordinate values, used to create a shape for which unit work history has been stored. Sebastian discloses only the combination of previously stored feature templates, which are created through a long series of design procedures. Sebastian does not disclose or suggest the creation of a shape by sequentially reproducing unit work history data. Shebini and Baraquet also do not disclose or suggest this feature.

Because the cited references, taken alone or in combination, do not disclose all of the features recited in the independent claims 1, 2, 7, 9, 11-15, 17-20, *e.g.*, determining, "using [a] corresponding surface group, errors in [a] combined shape model," "wherein the errors determined using the corresponding surface group include at least one of a change of a number of configuring surfaces, a change in direction or quantity of border lines, reversal of a direction of a surface, and folding of a surface," and "sequentially reproducing" the unit work history," these independent claims should be allowable. Claims 5, 6, 8, 10, 16, and 21 variously depend from the independent claims, and are also allowable for at least the same reasons.

Applicant also respectfully requests reconsideration and withdrawal of the 35 U.S.C. §103(a) rejection of claim 22 over Sebastian in view of Barequet. Independent

claim 22 includes recitations similar to those mentioned above in connection with independent claims 1, 2, 7, 9, 11-15, 17-20, and is therefore allowable over the cited references for at least the same reasons.

In view of the foregoing remarks, Applicant respectfully requests reconsideration of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

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By: /Richard Hanna/
Richard M. Hanna
Registration No. 65,031
(202) 408-4496